IS 565 (1984): Specification for DDT Water Dispersible Powder Concentrate [FAD 1: Pesticides and Pesticides Residue Analysis]

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Indian Standard

SPECIFICATION FOR DDT WATER DISPERSIBLE POWDER CONCENTRATES

(Third Revision)

UDC 632'951 DDT

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR DDT WATER DISPERSIBLE POWDER CONCENTRATES

(Third Revision)

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AMENDMENT NO. 1 JULY 1988

TO

IS : 565-1984 SPECIFICATION FOR DDT WATER DISPERSIBLE POWDER CONCENTRATES

(Third Revision)

(*Page* 5, *Table* 1) — Add the following note at the end of Table 1:

'NOTE — The material shall not be subjected to accelerated storage treatment if it has crossed half of its shelf life as ascertained from its date of manufacture and date of expiry declared on the container.'

(AFCDC 6)

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AMENDMENT NO. 2 MAY 1994
TO
IS 565 : 1984 SPECIFICATION FOR DDT WATER DISPERSIBLE POWDER CONCENTRATES

(Third Revision)

(*Page* 5, *Table* 1):

a) Sl No. (ii), col 2
b) Sl No. (iii), col 2

} — Delete the words 'after accelerated storage'.

(*Page* 6, *clause* **4.1**) — Substitute the following for the existing:

'When freshly manufactured material in bulk quantity is offered for inspection, representative samples of the material shall be drawn and tested as prescribed in IS 10627 : 1983 within 90 days of its manufacture. When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627 : 1983. However, the criteria for conformity of the material when tested, shall be the limits of tolerances, as applicable over the declared nominal value and given under clause **2.2.1** of the standard.'

(FAD 1)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR DDT WATER DISPERSIBLE POWDER CONCENTRATES

(Third Revision)

0. FOREWORD

0.1 This Indian Standard (Third Revision) was adopted by the Indian Standards Institution on 29 June 1984, after the draft finalized by the Pest Control Sectional Committee had been approved by the Agricultural and Food Products Division Council and the Chemical Division Council.

0.2 This standard was first issued in 1955. Subsequently, its first revision was issued in 1961, when besides specifying metric values for the requirements for various characteristics, a modified scheme for sampling and methods of test for certain characteristics were included. Since first revision, Indian industry had gained considerable experience in formulating DDT water dispersible powder concentrates. The technical committee responsible for the formulation of this standard, therefore, decided to revise the existing specification to update its requirements. Accordingly, in the second revision requirements for the various characteristics had been reviewed and verified. Besides, all the six amendments issued earlier were also incorporated. In this revision requirements are again being updated. Four amendments issued to second revision have also been incorporated.

0.3 DDT (dichlorodiphenyl trichloroethane) water dispersible powder concentrates are extensively used in the control of insect pests of agricultural and public health importance.

0.4 DDT water dispersible powder concentrates are generally manufactured to contain 50 percent (*m/m*) DDT.

0.5 In the preparation of this standard due consideration has been given to the provisions of the *Insecticides Act, 1968* and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated,

expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for DDT water dispersible powder concentrates.

2. REQUIREMENTS

2.1 **Description** — The material shall be in the form of a homogenous powder, together with fillers and adjuvents, white to creamy in colour, and shall wet readily on mixing with water, providing a suspension suitable for use as a spray.

2.1.1 DDT, technical, employed in the manufacture of this material shall conform to IS : 563-1973†.

2.1.2 *Identity* — The material shall comply with identity test as prescribed under Appendix A of IS : 564-1984‡ and shall not contain any chlorinated pesticide other than DDT.

2.2 The material shall also comply with the requirements given in Table 1.

2.2.1 *DDT Content* — When determined by the method prescribed in Appendix A, the observed DDT content, percent (*m/m*), of any of the samples shall not differ from the declared nominal value by more than the tolerance limits indicated below:

Nominal Value, Percent	*Tolerance Limit*, Percent
Up to 9	+ 10, − 5
Above 9 and below 50	± 5
50 and above	+ 5, − 3

of the nominal value

2.2.1.1 The actual value of the DDT technical content in the formulation shall be calculated to the second decimal place and then rounded off to the first decimal place before applying the tolerance as stipulated in 2.2.1.

*Rules for rounding off numerical values (*revised*).
†Specification for DDT, technical (*second revision*).
‡Specification for DDT dusting powder (*third revision*).

2.2.1.2 The average content of all the samples taken shall not be less than the declared nominal content.

TABLE 1 REQUIREMENTS FOR DDT WATER DISPERSIBLE POWDER CONCENTRATES

(*Clause* 2.2)

Sl No.	Characteristic	Requirement	Method of Test, Ref to	
			Appendix of This Standard	Cl No. of IS : 6940-1982*
(1)	(2)	(3)	(4)	(5)
i)	DDT, technical content, percent by mass	Nominal value as declared on the container (*see* 2.2.1)	A	—
ii)	Sieving requirement, material passing through 75-micron IS Sieve† after accelerated storage, percent by mass, *Min*	97	—	11.1
iii)	Suspensibility after accelerated storage, percent by mass, *Min*	50	—	11.2
iv)	Acidity (as H_2SO_4), percent by mass, *Max*	0·25	—	11.3
	or			
	Alkalinity (as NaOH), percent by mass, *Max*	1·0	—	11.3

*Methods of test for pesticides and their formulations (*first revision*).

†*See* IS : 460 (Part 1)-1978 Specification for test sieves : Part 1 Wire cloth test sieves (*second revision*). BS Test Sieve 200, ASTM Test Sieve 200 and Tylor Test Sieve 200 which have their apertures within the limits specified for 75-micron IS Test Sieve, may be used as 75-micron IS Sieve.

3. PACKING AND MARKING

3.1 Packing — The material shall be packed as per requirements given in IS : 8190 (Part 1)-1980*.

3.2 Marking — The containers shall be securely closed and shall bear legibly and indelibly the following information in addition to the provisions as required under the *Insecticides Act* and the Rules:

a) Name of the material;

b) Name of the manufacturer;

*Requirements for packing of pesticides: Part 1 Solid pesticides (*first revision*).

c) Date of manufacture;

d) Batch Number;

e) Net mass of contents;

f) DDT, technical content, percent (*m/m*); and

g) The minimum cautionary notice worded as in the *Insecticides Act* and Rules.

3.2.1 Each container may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4. SAMPLING

4.1 Representative samples of the material shall be drawn as prescribed in IS : 10627-1983*.

5. TESTS

5.1 Tests shall be carried out by the methods referred to in col 4 and 5 of Table 1.

5.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977†) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

APPENDIX A

[*Table* 1, *Item* (*i*)]

DETERMINATION OF DDT TECHNICAL CONTENT

A-0. GENERAL

A-0.1 There are two methods for the determination of DDT, technical content, namely organic chlorine method and the hydrolysable chlorine

*Methods for sampling of pesticidal formulations.

†Specification for water for general laboratory use (*second revision*).

method. Whereas for routine purpose either of the two methods may be used, the latter method shall be used as a referee method in case of dispute.

A-1. TOTAL ORGANIC CHLORINE METHOD

A-1.1 Reagents

A-1.1.1 *Benzene* — free from thiophene and chlorine.

A-1.1.2 *Isopropyl Alcohol* — of two concentrations, namely, 99 percent, dry and 50 percent (*v/v*), aqueous solution.

A-1.1.3 *Metallic Sodium* — pure, in the form of ribbon or cut in small pieces.

A-1.1.4 *Phenolphthalein Indicator Solution* — one percent (*m/v*) in rectified spirit.

A-1.1.5 *Dilute Nitric Acid* — 1:1 (*v/v*).

A-1.1.6 *Standard Silver Nitrate Solution* — 0·1 N.

A-1.1.7 *Ferric Ammoninum Sulphate Solution* — saturated, aqueous, freshly prepared.

A-1.1.8 *Standard Potassium Thiocyanate Solution* — 0·1 N.

A-1.2 Procedure

A-1.2.1 Weigh accurately a quantity of the material containing about one gram of DDT and extract it quantitatively with benzene in a Soxhlet extractor, taking care to ensure that extraction is complete and channelling does not occur. Concentrate the extract to a small volume using a steam-bath, transfer it quantitatively to a 100-ml volumetric flask and make up the volume to the mark with benzene.

A-1.2.2 Transfer a 10-ml aliquot to a 250-ml ground glass joint. Erlenmeyor flask, add 25 ml of isopropyl alcohol (99 percent) and shake the flask to mix the contents. Add 2·5 g of metallic sodium, connect the flask to a reflux condenser and boil the contents gently for at least two hours, shaking the flask occasionally. Dissolve the excess metallic sodium by cautiously adding 10 ml of isopropyl alcohol (50 percent) through the condenser at the rate of one to two drops per second. Boil for another 10 minutes and then add 60 ml of water.

A-1.2.3 Cool, add 2 to 3 drops of phenolphthalein indicator solution. Neutralize by adding dilute nitric acid dropwise and then add 10 ml in

excess. If necessary, cool the flask to room temperature; add a known volume of the standard silver nitrate solution in slight excess and coagulate the precipitated silver chloride by digesting on a steam-bath for half an hour, with frequent stirring. Cool the flask and, if necessary, filter the contents of the flask through a fast quantitative filter paper collecting the filtrate quantitatively in a conical flask. Add 5 ml of ferric ammonium sulphate solution either to the cooled unfiltered mixture or to the filtrate, as the case may be, and titrate the excess of the silver nitrate with the standard potassium thiocyanate solution. (The end point is the appearance of red ferric thiocyanate colour.)

A-1.2.4 Carry out a blank determination using the method given under **A-1.2.1** to **A-1.2.3**.

A-1.3 Calculation

$$\text{DDT, technical content, percent by mass} = \frac{70{\cdot}92\,(V - v)\,N}{M}$$

where

V = volume, in ml, of the standard potassium thiocyanate solution used for the blank determination (*see* **A-1.2.4**);

v = volume, in ml, of the standard potassium thiocyanate solution used for the test with the material (*see* **A-1.2.3**);

N = normality of the standard potassium thiocyanate solution; and

M = mass, in g, of the material taken for test (*see* **A-1.2.1**).

A-2. HYDROLYSABLE CHLORINE METHOD

A-2.1 Reagents

A-2.1.1 *Acetone*

A-2.1.2 *Alcoholic Potassium Hydroxide Solution* — 1 N.

A-2.1.3 *Dilute Nitric Acid* — 2 N.

A-2.1.4 *Standard Silver Nitrate Solution* — 0·1 N.

A-2.1.5 *Ferric Ammonium Sulphate Solution* — Saturated, aqueous, freshly prepared.

A-2.1.6 *Standard Potassium Thiocyanate Solution* — 0·1 N.

A-2.2 Procedure

A-2.2.1 Weigh accurately a quantity of the material containing about 0·5 g of DDT and extract it quantitatively with acetone in a Soxhlet extractor, taking care to ensure that the extraction is complete and channeling does not occur. Quantitatively transfer the extract to an Erlenmeyer flask and concentrate the extract on a water-bath to a volume of about 50 ml.

A-2.2.2 To the whole of the extract (**A-2.2.1**), add 20 ml of alcoholic potassium hydroxide solution, keep it at 20 to 25°C for 15 minutes and then add 50 ml of water. Add 20 ml of dilute nitric acid and exactly 25 ml of the standard silver nitrate solution. Coagulate the precipitate of silver chloride by digesting on a steam-bath for half an hour, with frequent stirring. Cool the flask and, if necessary, filter the contents of the flask through a fast qualitative filter paper collecting the filtrate quantitatively in a conical flask. Add 5 ml of ferric ammonium sulphate solution either to the cooled unfiltered mixture or to the filtrate, as the case may be, and titrate the excess of the silver nitrate with the standard potassium thiocyanate solution.

A-2.2.3 Carry out a blank determination using the method given under **A-2.2.1** and **A-2.2.2** except to the extent that 20 ml of alcohlic potassium hydroxide be added after adding 20 ml of dilute nitric acid first.

A-2.3 Calculation

$$\text{DDT, technical, content, percent by mass} = \frac{35{\cdot}46\,(V - v)N}{M}$$

where

V = volume, in ml, of the standard potassium thiocyanate solution used for the blank determination (*see* **A-2.2.3**);

v = volume, in ml, of the standard potassium thiocyanate solution used for the test with the material (*see* **A-2.2.2**);

N = normality of the standard potassium thiocyanate solution; and

M = mass, ing, of the material taken for the test (*see* **A-2.2.1**).

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

Quantity	*Unit*	*Symbol*
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

Quantity	*Unit*	*Symbol*
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

Quantity	*Unit*	*Symbol*	*Definition*
Force	newton	N	1 N = 1 kg.m/s^2
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m^2
Frequency	hertz	Hz	1 Hz = 1 c/s (s^{-1})
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/M^2

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